

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions, including listings, of claims in the application.

Listing of Claims

Claim 1 (currently amended): ~~A substantially pure~~ An isolated conopeptide selected from the group consisting of:

(a) contulakin-G comprising the amino acid sequence Xaa₁-Ser-Glu-Glu-Gly-Gly-Ser-Asn-Ala-Thr-Lys-Lys-Xaa₂-Tyr-Ile-Leu (SEQ ID NO:1), where Xaa₁ is pyro-Glu, Xaa₂ is proline or hydroxyproline and Thr₁₀ is modified to contain an O-glycan, wherein said glycan is not Gal(β1-3)GalNAc(α1-);

(b) a generic contulakin-G having the following general formula ~~Xaa₁-Xaa₂-Xaa₃-Xaa₄-Gly-Gly-Xaa₂-Xaa₄-Xaa₅-Xaa₆-Xaa₇-Xaa₈-Xaa₇-Xaa₉-Xaa₁₀-Ile-Leu~~ Xaa₁-Xaa₂-Xaa₃-Xaa₄-Gly-Gly-Xaa₂-Xaa₄-Xaa₅-Xaa₆-Xaa₇-Xaa₈-Xaa₉-Xaa₁₀-Ile-Leu (SEQ ID NO:2), where Xaa₁ is pyro-Glu, Glu, Gln or γ-carboxy-Glu; Xaa₂ is Ser, Thr or S-glycan modified Cys; Xaa₃ is Glu or γ-carboxy-Glu; Xaa₄ is Asn, N-glycan modified Asn or S-glycan modified Cys; Xaa₅ is Ala or Gly; Xaa₆ is Thr, Ser, O-glycan modified Thr, O-glycan modified Ser, S-glycan modified Cys, Tyr or any hydroxy containing unnatural amino acid; Xaa₇ is Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys, Arg, ornithine, homoarginine or any unnatural basic amino acid; Xaa₈ is Ala, Gly, Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys, Arg, ornithine, homoarginine, any unnatural basic amino acid or X-Lys where X is (CH₂)_n, phenyl, -(CH₂)_m-(CH=CH)-(CH₂)_mH or -(CH₂)_m-(C≡C)-(CH₂)_mH in which n is 1-4 and m is 0-2; Xaa₉ is Pro or hydroxy-Pro; and Xaa₁₀ is Tyr, mono-iodo-Tyr, di-iodo-Tyr, O-sulpho-Tyr, O-phospho-Tyr, nitro-Tyr, Trp, D-Trp, bromo-Trp, bromo-D-Trp, chloro-Trp, chloro-D-Trp, Phe, L-neo-Trp, or any unnatural aromatic amino acid, with the proviso that the generic contulakin-G is not a peptide of the formula Xaa₁-Ser-Glu-Glu-Gly-Gly-Ser-Asn-Ala-Thr-

Lys-Lys-Xaa₂-Tyr-Ile-Leu (SEQ ID NO:1), wherein Xaa₁ is pyro-Glu, Xaa₂ is proline or hydroxyproline and Thr₁₀ is unmodified or modified to contain an O-glycan;

(c) a generic contulakin-G of (b) which is modified to contain an O-glycan, an S-glycan or an N-glycan;

(d) a contulakin-G analog which comprises an N-terminal truncation of from 1 to 9 amino acids of the generic contulakin-G of (b);

(e) a contulakin-G analog of ~~(c)~~ (d), wherein an Ser-O-glycan, Thr-O-glycan or Cys-S-glycan is substituted for the amino acid residue at the truncated N-terminus;

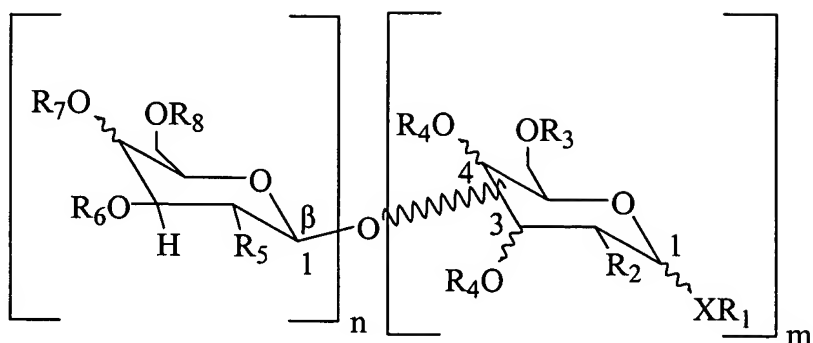
(f) a contulakin-G analog, wherein an Ser-O-glycan, Thr-O-glycan or Cys-S-glycan is substituted for a residue at positions 1-9 of the generic contulakin-G of (b); and

(g) a contulakin-G analog which comprises an N-terminal truncation of 10 amino acids of the generic contulakin-G of (b) which is further modified to contain a Lys-N-glycan at residue 11 of the generic contulakin-G.

Claim 2 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is Xaa₂ of Contulakin-G of (a) and Xaa₂ is proline.

Claim 3 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is Xaa₂ of Contulakin-G of (a) and Xaa₂ is hydroxy-proline.

Claim 4 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is glycan of Contulakin-G of (a) and the glycan has the structure



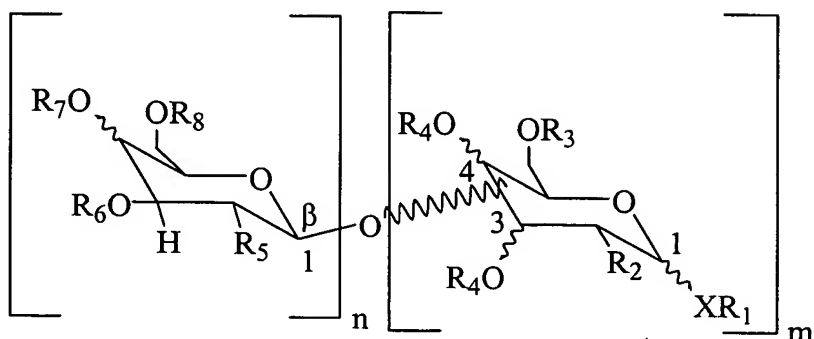
wherein R_1 is an amino acid capable of being derivatized with a glycan either chemically or enzymatically Thr; X is O; R_2 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, or O-glycan; R_3 is H, SO_3 , PO_3 , acetyl, sialic acid or monosaccharide; R_4 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_5 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, O-monosaccharide or, O-acetyl; R_6 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_7 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_8 is H, SO_3 , PO_3 , acetyl or monosaccharide; n is 0-4 and m is 1-4.

Claim 5 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 4, wherein the conopeptide is Xaa₂ of Contulakin-G of (a) and Xaa₂ is proline.

Claim 6 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 4, wherein the conopeptide is Xaa₂ of Contulakin-G of (a) and Xaa₂ is hydroxy-proline.

Claim 7 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is selected from the group consisting glycan of the generic Contulakin-G of (b)-(c) and the Contulakin-G analog of (d)-(g) and the glycan is Gal(β 1-3)GalNAc(α 1-).

Claim 8 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is selected from the group consisting glycan of the generic Contulakin-G of (b)-(c) and the Contulakin-G analog of (d)-(g) and the glycan has the structure

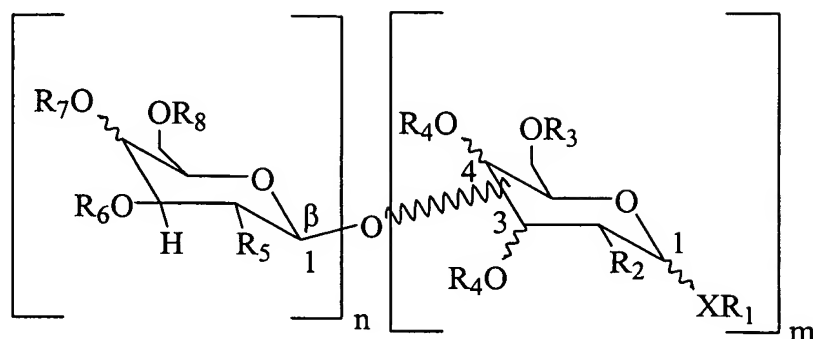


wherein R_1 is ~~an amino acid capable of being derivatized with a glycan either chemically or enzymatically~~ Thr, Ser, Cys or Lys; X is O when R_1 is Thr or Ser, or X is S when R_1 is Cys or X is N when R_1 is Asn or Lys; R_2 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, or O-glycan; R_3 is H, SO_3 , PO_3 , acetyl, sialic acid or monosaccharide; R_4 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_5 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, O-monosaccharide or, O-acetyl; R_6 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_7 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_8 is H, SO_3 , PO_3 , acetyl or monosaccharide; n is 0-4 and m is 1-4.

Claim 9 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is the generic Contulakin-G of (b).

Claim 10 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 9, wherein the glycan is $Gal(\beta 1-3)GalNAc(\alpha 1-)$.

Claim 11 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 9, wherein the glycan has the structure

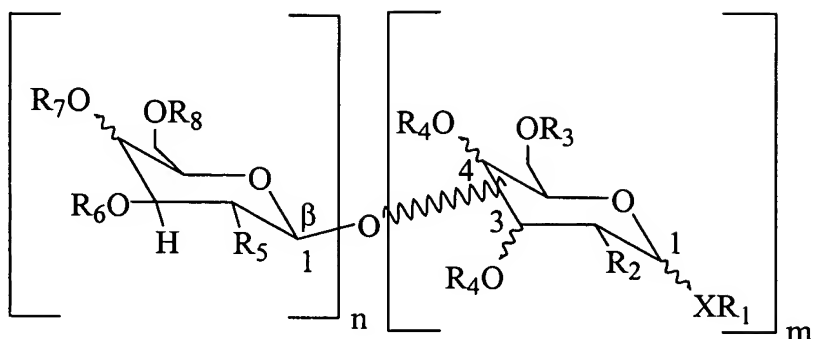


wherein R_1 is ~~an amino acid capable of being derivatized with a glycan either chemically or enzymatically~~ Thr, Ser or Cys; X is O when R_1 is Thr or Ser, or X is S when R_1 is Cys or X is N when R_1 is Asn; R_2 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, or O-glycan; R_3 is H, SO_3 , PO_3 , acetyl, sialic acid or monosaccharide; R_4 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_5 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, O-monosaccharide or, O-acetyl; R_6 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_7 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_8 is H, SO_3 , PO_3 , acetyl or monosaccharide; n is 0-4 and m is 1-4.

Claim 12 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is the generic Contulakin-G of (c).

Claim 13 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 12, wherein the glycan is $Gal(\beta 1 \rightarrow 3)GalNAc(\alpha 1 \rightarrow)$.

Claim 14 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 12, wherein the glycan has the structure

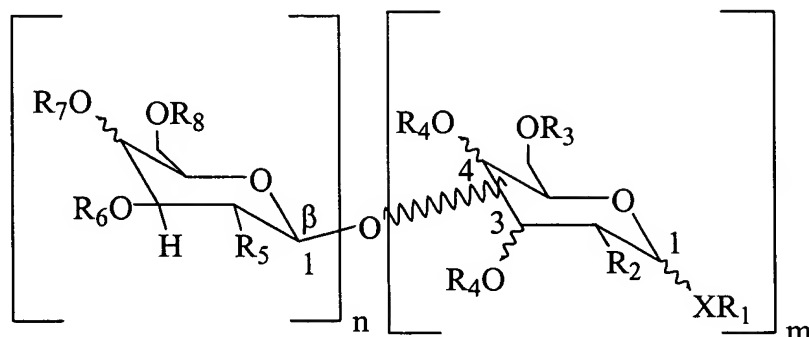


wherein R₁ is ~~an amino acid capable of being derivatized with a glycan either chemically or enzymatically~~ Thr, Ser or Cys; X is O when R₁ is Thr or Ser, or X is S when R₁ is Cys or X is N when R₁ is Asn; R₂ is OH, NH₂, NHSO₃Na, NHAc, O-sulphate, O-phosphate, or O-glycan; R₃ is H, SO₃, PO₃, acetyl, sialic acid or monosaccharide; R₄ is H, SO₃, PO₃, acetyl or monosaccharide; R₅ is OH, NH₂, NHSO₃Na, NHAc, O-sulphate, O-phosphate, O-monosaccharide or, O-acetyl; R₆ is H, SO₃, PO₃, acetyl or monosaccharide; R₇ is H, SO₃, PO₃, acetyl or monosaccharide; R₈ is H, SO₃, PO₃, acetyl or monosaccharide; n is 0-4 and m is 1-4.

Claim 15 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is the Contulakin-G analog of (d).

Claim 16 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 15, wherein the glycan is Gal(β1-3)GalNAc(α1-).

Claim 17 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 15, wherein the glycan has the structure

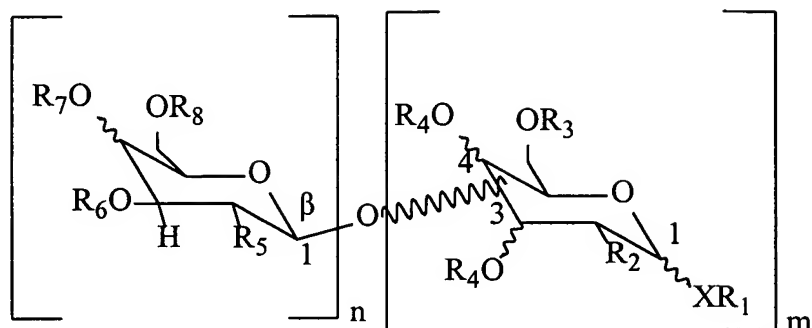


wherein R_1 is ~~an amino acid capable of being derivatized with a glycan either chemically or enzymatically~~ Thr, Ser or Cys; X is O when R_1 is Thr or Ser, or X is S when R_1 is Cys or X is N when R_1 is Asn; R_2 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, or O-glycan; R_3 is H, SO_3 , PO_3 , acetyl, sialic acid or monosaccharide; R_4 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_5 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, O-monosaccharide or, O-acetyl; R_6 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_7 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_8 is H, SO_3 , PO_3 , acetyl or monosaccharide; n is 0-4 and m is 1-4.

Claim 18 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is the Contulakin-G analog of (e).

Claim 19 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 18, wherein the glycan is $Gal(\beta 1 \rightarrow 3)GalNAc(\alpha 1 \rightarrow)$.

Claim 20 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 18, wherein the glycan has the structure

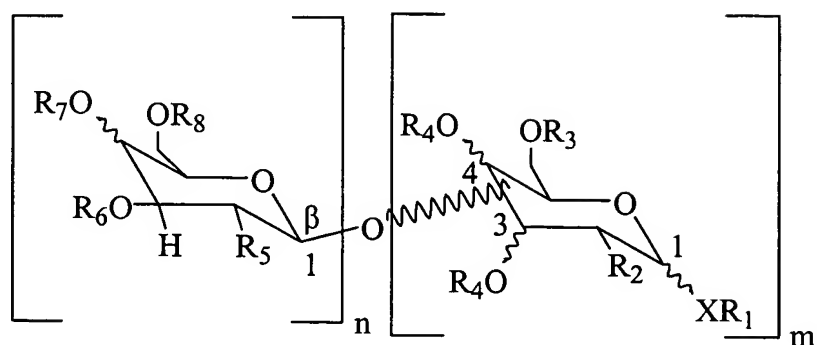


wherein R_1 is ~~an amino acid capable of being derivatized with a glycan either chemically or enzymatically~~ Thr, Ser or Cys; X is O when R_1 is Thr or Ser, or X is S when R_1 is Cys or X is N when R_1 is Asn; R_2 is an amino acid capable of being derivatized with a glycan either chemically or enzymatically; R_2 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, or O-glycan; R_3 is H, SO_3 , PO_3 , acetyl, sialic acid or monosaccharide; R_4 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_5 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, O-monosaccharide or, O-acetyl; R_6 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_7 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_8 is H, SO_3 , PO_3 , acetyl or monosaccharide; n is 0-4 and m is 1-4.

Claim 21 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is the Contulakin-G analog of (f).

Claim 22 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 21, wherein the glycan is $Gal(\beta 1 \rightarrow 3)GalNAc(\alpha 1 \rightarrow)$.

Claim 23 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 21, wherein the glycan has the structure

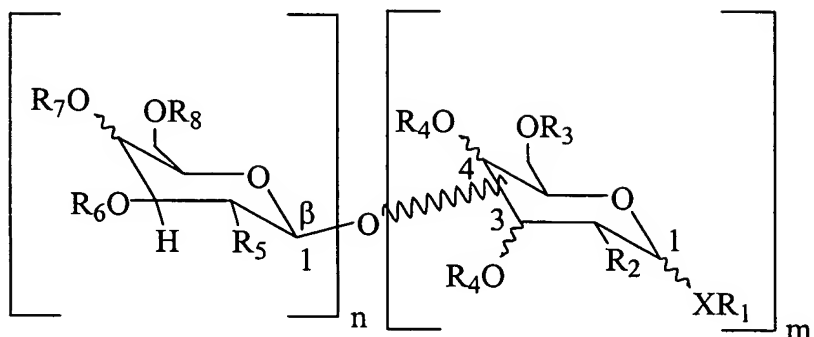


wherein R_1 is ~~an amino acid capable of being derivatized with a glycan either chemically or enzymatically~~ Thr, Ser or Cys; X is O when R_1 is Thr or Ser, or X is S when R_1 is Cys or X is N when R_1 is Asn; R_2 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, or O-glycan; R_3 is H, SO_3 , PO_3 , acetyl, sialic acid or monosaccharide; R_4 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_5 is OH, NH_2 , $NHSO_3Na$, $NHAc$, O-sulphate, O-phosphate, O-monosaccharide or, O-acetyl; R_6 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_7 is H, SO_3 , PO_3 , acetyl or monosaccharide; R_8 is H, SO_3 , PO_3 , acetyl or monosaccharide; n is 0-4 and m is 1-4.

Claim 24 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1, wherein the conopeptide is the Contulakin-G analog of (g).

Claim 25 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 24, wherein the glycan is $Gal(\beta 1 \rightarrow 3)GalNAc(\alpha 1 \rightarrow)$.

Claim 26 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 24, wherein the glycan has the structure



wherein R₁ is ~~an amino acid capable of being derivatized with a glycan either chemically or enzymatically~~ Lys; X is N; R₂ is OH, NH₂, NHSO₃Na, NHAc, O-sulphate, O-phosphate, or O-glycan; R₃ is H, SO₃, PO₃, acetyl, sialic acid or monosaccharide; R₄ is H, SO₃, PO₃, acetyl or monosaccharide; R₅ is OH, NH₂, NHSO₃Na, NHAc, O-sulphate, O-phosphate, O-monosaccharide or, O-acetyl; R₆ is H, SO₃, PO₃, acetyl or monosaccharide; R₇ is H, SO₃, PO₃, acetyl or monosaccharide; R₈ is H, SO₃, PO₃, acetyl or monosaccharide; n is 0-4 and m is 1-4.

Claim 27 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 1 which is chemically synthesized.

Claim 28 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 4 which is chemically synthesized.

Claim 29 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 7 which is chemically synthesized.

Claim 30 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 8 which is chemically synthesized.

Claim 31 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 9 which is chemically synthesized.

Claim 32 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 10 which is chemically synthesized.

Claim 33 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 11 which is chemically synthesized.

Claim 34 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 12 which is chemically synthesized.

Claim 35 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 13 which is chemically synthesized.

Claim 36 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 14 which is chemically synthesized.

Claim 37 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 15 which is chemically synthesized.

Claim 38 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 16 which is chemically synthesized.

Claim 39 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 17 which is chemically synthesized.

Claim 40 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 18 which is chemically synthesized.

Claim 41 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 19 which is chemically synthesized.

Claim 42 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 20 which is chemically synthesized.

Claim 43 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 21 which is chemically synthesized.

Claim 44 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 22 which is chemically synthesized.

Claim 45 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 23 which is chemically synthesized.

Claim 46 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 24 which is chemically synthesized.

Claim 47 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 25 which is chemically synthesized.

Claim 48 (currently amended): The ~~substantially pure~~ isolated conopeptide of claim 26 which is chemically synthesized.